Successful treatment of adalimumab-resistant palmoplantar pustulosis with secukinumab: a case report

Qing-Yang Li, Gang Wang

Department of Dermatology, Xijing Hospital, Fourth Military Medical University, Xi'an, Shaanxi 710032, China.

To the Editor: Palmoplantar pustulosis (PPP) is a chronic recalcitrant disease. Various biologics have been used to successfully treat plaque psoriasis, but their use to treat PPP is limited. Despite their promising effects, biologics such as tumor necrosis factor-α (TNF-α) inhibitors may aggravate or induce PPP. Herein, we report a patient with PPP refractory to the TNF-α inhibitor adalimumab, but successfully treated with the interleukin-17A (IL-17A) inhibitor secukinumab.

In 2019, a 25-year-old, 65 kg Chinese woman with erythema and dried pustules in palms and soles, and nail thickening was clinically diagnosed with PPP [Figure 1A]. The pustules occurred in 2018 and gradually exacerbated. There was no family history of psoriasis. Fungal tests were negative. Her previous doctors prescribed her topical calcipotriol but with limited response. Therefore, she consented for biotherapy with the expectation of recovery. We treated her with adalimumab 80 mg on day 1, and 40 mg on day 8, and then 40 mg every week. She responded well for the first 5 weeks of adalimumab treatment, with alleviated pustules [Figure 1B]. However, after 9 weeks of adalimumab treatment, her lesions relapsed and aggravated [Figure 1C], and erythematous and scaling lesions appeared on her thighs. Therefore, we discontinued adalimumab and started secukinumab 300 mg on days 1, 8, 15, 22, and 29, and then once every month. After five doses of secukinumab, the lesions on her hands and thighs were completely cleared without intermittent flares for more than 5 months [Figure 1D].

PPP is often recalcitrant to traditional therapies including corticosteroids, systemic immunosuppressants, and phototherapy. Psoriasis and PPP, although with different clinical manifestations, share pathophysiological mechanisms. Various approved biologics with substantial effects in psoriasis treatment have not been indicated for PPP treatment. On the basis of several reported cases of successful PPP treatment with biotherapy, we initiated adalimumab therapy. However, after adalimumab treatment, her symptoms relapsed, and new psoriatic lesions emerged in the lower limbs. We consider that adalimumab aggravated PPP and might have induced psoriasis in our patient. TNF-α inhibitors may induce PPP, which requires changing or discontinuing TNF-α inhibitors or adding systemic treatments.[1] For instance, ustekinumab and tofacitinib have been used to treat patients with PPP who failed to recover or were induced by TNF-α therapy.[2] Secukinumab combined with methotrexate showed promising effects in pyoderma gangrenosum and pustular psoriasis induced by certolizumab in ankylosing spondylitis.[3] However, to the best of our knowledge, there is no study on the use of secukinumab for PPP refractory to or induced by TNF-α inhibitor.

Secukinumab is a human monoclonal antibody that selectively binds to and inhibits IL-17A, integral to the pathogenesis of psoriasis and PPP. A randomized controlled trial in chronic PPP showed that secukinumab may be effective in reducing severity, but skin clearance has not been reported.[4] Remarkably, the pustules and psoriatic lesions induced and exacerbated by adalimumab in our case completely disappeared after secukinumab treatment. Based on the recognized pathogenesis of psoriasis and PPP, we speculate two underlying mechanisms for this reversal. First, TNF-α inhibitors result in an uncontrolled increase in type I interferons produced by plasmacytoid dendritic cells. This may promote the activation and maturation of conventional dendritic cells, stimulate $CD8^+$ T cells,[5] and/or induce and/or worsen psoriatic lesions. Second, IL-17 activates keratinocytes to produce large amounts of chemokines and recruits neutrophils infiltrating the epidermis. Therefore, IL-17A inhibitors may alleviate pustular lesions more potently. Our case suggests that secukinumab may be more effective in treating PPP than adalimumab, but its validity requires further investigation.

Access this article online

Quick Response Code:

Website: www.cmj.org

DOI: 10.1097/CM9.0000000000001246

Correspondence to: Prof. Gang Wang, Department of Dermatology, Xijing Hospital, Fourth Military Medical University, 127 Changlexi Road, Xi'an, Shaanxi, 710032, China
E-Mail: xjwgang@fmmu.edu.cn

Chinese Medical Journal 2020;133(24)

Received: 28-06-2020 **Edited by:** Li-Shao Guo

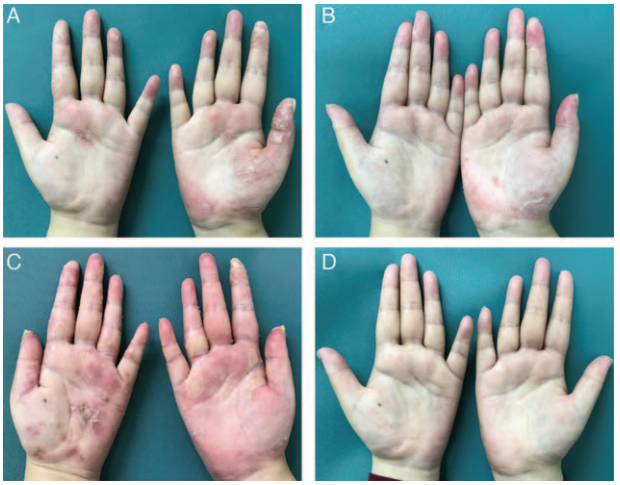

Figure 1: Palmoplantar pustulosis before and after biotherapy. (A) Dried pustules on the erythematous background on the palms before biotherapy. (B) Alleviated pustules and scaling on the palms after 5 weeks of adalimumab treatment. (C) Severe palmoplantar inflammation with pustules and scaling after 9 weeks of adalimumab therapy. (D) Cleared pustules and erythema on palms after 5 months of secukinumab treatment.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given her consent for her images and other clinical information to be reported in the article. The patient understands that her name and initials will not be published, and due efforts will be made to conceal the identity of the patient, although anonymity cannot be guaranteed.

Acknowledgements

The authors would like to thank their patient for her enthusiastic participation.

Funding

This study was supported by a grant from the National Natural Science Foundation of China (No. 81872518).

Conflicts of interest

None.

References

1. Brown G, Wang E, Leon A, Huynh M, Wehner M, Matro R, *et al*. Tumor necrosis factor-α inhibitor-induced psoriasis: systematic review of clinical features, histopathological findings, and management experience. J Am Acad Dermatol 2017;76:334–341. doi: 10.1016/j.jaad.2016.08.012.
2. Wang YA, Rosenbach M. Successful treatment of refractory tumor necrosis factor inhibitor-induced palmoplantar pustulosis with tofacitinib: Report of case. JAAD Case Rep 2020;6:115–118. doi: 10.1016/j.jdcr.2019.12.006.
3. Gawdzik A, Ponikowska M, Jankowska-Konsur A, Woźniak Z, Maj J, Szepietowski JC. Paradoxical skin reaction to certolizumab, an overlap of pyoderma gangrenosum and psoriasis in a young woman treated for ankylosing spondylitis: case report with literature review. Dermatol Ther (Heidelb) 2020;10:869–879. doi: 10.1007/s13555-020-00398-4.
4. Obeid G, Do G, Kirby L, Hughes C, Sbidian E, Le Cleach L. Interventions for chronic palmoplantar pustulosis. Cochrane database Syst Rev 2020;1:CD011628. doi: 10.1002/14651858.CD011628.pub2.
5. Wang J, Li X, Hou WJ, Dong LX, Cao J. Endothelial function and T-lymphocyte subsets in patients with overlap syndrome of chronic obstructive pulmonary disease and obstructive sleep apnea. Chin Med J 2019;132:1654–1659. doi: 10.1097/CM9.0000000000000312.

How to cite this article: Li QY, Wang G. Successful treatment of adalimumab-resistant palmoplantar pustulosis with secukinumab: a case report. Chin Med J 2020;133:3013–3014. doi: 10.1097/CM9.0000000000001246